3. The microactuator of claim 2 wherein the first beam pair element comprises two first beam elements aligned with a width of the rotor.

4. The microactuator of claim 3 wherein the second beam pair element comprises two second beam elements, one length of each second beam element being aligned with a length of the rotor and a transverse length of each second beam element being aligned the width of the rotor.

5. The microactuator of claim 1 wherein the means for limiting deflection of the stator is operable to limit deflection of the stator out of a plane defined by the microactuator frame to less than one micron.

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6. The microactuator of claim 1, and further comprising:
at least one deflection limiter for limiting deflection of the stator in the direction of the length of the rotor.

7. (Amended) A disc drive having a recording disc rotatable about an axis, a slider supporting a transducing head for transducing data with the disc, and a dual-stage actuation assembly supporting the slider to finely position the transducing head adjacent a selected radial track of the disc, the dual-stage actuation assembly comprising:
a movable actuator arm;
a suspension assembly supported by the actuator arm, the suspension assembly including a flexure;
a slider bonding pad supporting the slider; and
a microactuator comprising:
a rotor attached to the slider;
a stator attached to the flexure; and
a beam structure operatively connecting the rotor to the stator so as to permit movement of the rotor with respect to the stator wherein the beam structure limits deflection of the stator out of a plane defined by the microactuator, the beam structure including a first beam pair element

aligned with a width of the rotor and a second beam pair element aligned with a length and the width of the rotor.

8. The disc drive of claim 7 wherein the first beam pair element comprises two first beam elements.

9. The disc drive of claim 8 wherein the two first beam elements define a rotation center, the rotation center defining a center of in-plane rotation of the rotor.

10. The disc drive of claim 9 wherein the rotor is balanced about the rotation center.

11. (Amended) The disc drive of claim 7, and further comprising:

a distal connector connecting the distal end of a magnet bonding pad and the slider bonding pad, wherein the distal connector is located at the rotation center.

12. The disc drive of claim 7 wherein the second beam pair element comprises two second beam elements in a dog-leg configuration, comprising:

a left lateral beam wherein one length is aligned with the length of the rotor and a transverse length is aligned with the width of the rotor; and

a right lateral beam wherein one length is aligned with the length of the rotor and a transverse length is aligned with the width of the rotor.

13. The disc drive of claim 12 wherein the second beam pair element is connected to the stator.

14. The disc drive of claim 12, and further comprising:

a proximal connector connecting the proximal end of the rotor and the second beam pair element.

15. The disc drive of claim 14 wherein the proximal connector is attached to the left lateral beam and the right lateral beam.

16. The disc drive of claim 7 wherein the beam structure has a height of approximately 200 microns.

17. The disc drive of claim 16 wherein the rotor stresses the beam structure to less than approximately 8.8% of its breaking strength.

18. The disc drive of claim 7 wherein the microactuator includes at least one deflection limiter for limiting deflection in the direction of the length of the rotor.

19. The disc drive of claim 18 wherein each deflection limiter comprises:

a hook formed in the slider bonding pad; and

a stop wall formed in the stator such that when the slider is longitudinally pulled away from the stator the hook engages the stop wall and prevents further movement of the slider.

20. (Amended) A disc drive having a recording disc rotatable about an axis, a slider supporting a transducing head for transducing data with the disc, and a dual-stage actuation assembly supporting the slider to finely position the transducing head adjacent a selected radial track of the disc, the dual-stage actuation assembly comprising:

a movable actuator arm;

a suspension assembly supported by the actuator arm, the suspension assembly including a flexure; and

a microactuator comprising:

a rotor attached to the slider;

a stator attached to the flexure; and

means for operatively connecting the rotor to the stator so as to permit movement of the rotor with respect to the stator, wherein the means

A1

permits microactuation of the microactuator while limiting motion of the stator out of a horizontal plane of the microactuator and limiting motion of the slider longitudinally.

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21. (New) A disc drive having a recording disc rotatable about an axis, a slider supporting a transducing head for transducing data with the disc, and a dual-stage actuation assembly supporting the slider to finely position the transducing head adjacent a selected radial track of the disc, the dual-stage actuation assembly comprising:

a movable actuator arm;

a suspension assembly supported by the actuator arm, the suspension assembly including a flexure;

a slider bonding pad supporting the slider; and

a microactuator comprising:

a rotor attached to the slider;

a stator attached to the flexure;

a beam structure operatively connecting the rotor to the stator so as to permit movement of the rotor with respect to the stator, the beam structure including a first beam pair element aligned with a width of the rotor and a second beam pair element aligned with a length and the width of the rotor; and

a distal connector connecting the distal end of a magnet bonding pad and the slider bonding pad, wherein the distal connector is located at the rotation center.

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22. (New) A disc drive having a recording disc rotatable about an axis, a slider supporting a transducing head for transducing data with the disc, and a dual-stage actuation assembly supporting the slider to finely position the transducing head adjacent a selected radial track of the disc, the dual-stage actuation assembly comprising:

a movable actuator arm;

a suspension assembly supported by the actuator arm, the suspension assembly including a flexure;

a slider bonding pad supporting the slider; and

a microactuator comprising:

a rotor attached to the slider;

a stator attached to the flexure;

a beam structure operatively connecting the rotor to the stator so as to permit movement of the rotor with respect to the stator, the beam structure including a first beam pair element aligned with a width of the rotor and a second beam pair element aligned with a length and the width of the rotor; and

at least one deflection limiter for limiting deflection in the direction of the length of the rotor.

23. (New) The disc drive of claim 22 wherein each deflection limiter comprises:

a hook formed in the slider bonding pad; and

a stop wall formed in the stator such that when the slider is longitudinally pulled away from the stator the hook engages the stop wall and prevents further movement of the slider.

REMARKS

This is in response to the Office Action mailed on February 21, 2003, in which claims 1-6 are allowed, claims 7-10, 12-17 and 20 are rejected, and claims 11, 18 and 19 are objected to. The applicant has amended claim 11 as indicated allowable by the Examiner.

Claim 7-10, 12-16, and 20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Adams et al. (U.S. Patent No. 6,466,412) in view of Takeuchi et al. (U.S. Patent No. 6,465,934), and claim 17 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Adams et al. and Takeuchi et al., and further in view of applicant admitted prior art.

Claim 7 has been amended such that the actuator includes a beam structure which "limits deflection of the stator out of a plane defined by the microactuator." In addition, claim 20